

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application.
Please cancel Claims 8 and 27-36, amend Claims 1-7, and add Claims 40-49 as follows:

1. (Currently Amended) A system for launching a projectile to remove a body of rock in an excavation, comprising:

a projectile that includes:

5 a nose, the nose being one of substantially flat and concave to inhibit deflection of the projectile from a face of the rock;

a body containing an explosive charge; and

10 a tail having a plurality of fins to control the trajectory of the projectile; and a tube for launching the projectile, wherein the nose is the one of substantially flat and concave after launch from the tube and a center of gravity of the projectile is located in the body and a center of pressure of the projectile is located in the tail.

2. (Currently Amended) The system of Claim 1, wherein the body contains a detonating device, the detonating device having a primer in a proximal end and a striker in a distal end, the striker and primer being separated from one another by a spring member which forces the striker away from the primer and a safety pin which restricts the motion of the striker towards the primer and the detonating device is located in a pocket in the projectile, the pocket having at least one of a length and width that exceeds a corresponding one of a length and width of the detonating device, thereby permitting at least one of longitudinal and latitudinal motion of the detonating device in the pocket in response to movement of the projectile.

3. (Currently Amended) The system of Claim 1, wherein the tube includes a cavity at a bottom of the tube for containing a propelling charge for launching the projectile from the tube outer diameter of the body is no less than about 25% and no more than about 100% of the outer diameter of the tail.

4. (Currently Amended) The system of Claim [[3]]1, further comprising:
a pusher plate located between the propelling charge and the bottom of the projectile, the top of the pusher plate being in contact with the bottom of the projectile for pushing the projectile out of the tube when the propelling charge is ignited wherein the tail has a length and the length is at least about 60% of the total length of the projectile.

5. (Currently Amended) The system of Claim [[4]]2, wherein the clearance between the outer perimeter of the pusher plate and the inside of the tube is relatively small to substantially seal gases from the ignited propelling charge in the cavity and thereby form a gas pressure differential on opposing sides of the pusher plate, with the gas pressure on the bottom of the pusher plate being greater than the gas pressure on the top of the pusher plate a gap between a sidewall of the detonating device and a sidewall of the pocket ranges from about 0.5 to about 4.0 mm.

6. (Currently Amended) The system of Claim [[4]]2, wherein the bottom of the pusher plate is concave a gap exists between an inner wall of the pocket and an outer wall of the detonating device and the gap ranges from about 0.5 to about 4.0 mm.

7. (Currently Amended) The system of Claim [[1]]2, wherein the explosive is selected from the group consisting of TNT, PETN, RDX, HMX, ammonium nitrate-based explosives, and mixtures thereof a distal end of the detonating device has a larger outer diameter than a proximal end of the detonating device such that the proximal end of the

5 detonating device can be received along substantially the entire length of the pocket and the distal end of the detonating device cannot be received along substantially the entire length of the pocket.

8-36. (Canceled)

37. (Previously Presented) The system of Claim 1, wherein said nose is concave.

38. (Previously Presented) The system of Claim 1, wherein said nose is substantially flat.

39. (Previously Presented) The system of Claim 1, wherein said nose has a diameter that is about equal to a maximum diameter of said projectile.

40. (New) A system for launching a projectile to remove a body of rock in an excavation, comprising:

projectile means for removing the body of rock that includes:

5 nose means for contacting the body of rock, the nose means being one of substantially flat and concave to inhibit deflection of the projectile means from a face of the rock;

body means for containing an explosive charge; and

tail means having a plurality of fins for controlling the trajectory of the projectile means; and

10 tube means for launching the projectile, wherein the nose means is the one of substantially flat and concave after launch from the tube means.

41. (New) The system of Claim 40, wherein a center of gravity of the projectile means is located in the body means and a center of pressure of the projectile means is located in the tail means.

42. (New) The system of Claim 40, wherein the body means contains a detonating device, the detonating device having a primer in a proximal end and a striker in a distal end, the striker and primer being separated from one another by a spring member which forces the striker away from the primer and a safety pin which restricts the motion of the striker towards the primer and the detonating device is located in a pocket in the projectile means, the pocket having at least one of a length and width that exceeds a corresponding one of a length and width of the detonating device, thereby permitting at least one of longitudinal and latitudinal motion of the detonating device in the pocket in response to movement of the projectile means.
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43. (New) The system of Claim 40, wherein the outer diameter of the body means is no less than about 25% and no more than about 100% of the outer diameter of the tail means.

44. (New) The system of Claim 40, wherein the tail means has a length and the length is at least about 60% of the total length of the projectile means.

45. (New) The system of Claim 41, wherein a gap between a sidewall of the detonating device and a sidewall of the pocket ranges from about 0.5 to about 4.0 mm.

46. (New) The system of Claim 41, wherein a gap exists between an inner wall of the pocket and an outer wall of the detonating device and the gap ranges from about 0.5 to about 4.0 mm.

47. (New) The system of Claim 41, wherein a distal end of the detonating device has a larger outer diameter than a proximal end of the detonating device such that the proximal end of the detonating device can be received along substantially the entire length of the pocket and the distal end of the detonating device cannot be received along substantially the entire length of the pocket.

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48. (New) The system of Claim 41, wherein the nose means is substantially flat.

49. (New) The system of Claim 41, wherein the nose means is concave.